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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,977	03/11/2004	Sam S. Tsai	BHT-3230-99	4055

7590 04/15/2008

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EXAMINER	
FINDLEY, CHRISTOPHER G	
ART UNIT	**PAPER NUMBER**
2621	
MAIL DATE	**DELIVERY MODE**
04/15/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/796,977	TSAI ET AL.	
	Examiner	Art Unit	
	CHRISTOPHER FINDLEY	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,7,16 and 17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,7,16 and 17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The Examiner notes that claims 2-6, 8-15, and 18-25 have been cancelled via the amendment filed 1/05/2008.

Response to Arguments

2. Applicant's arguments filed 1/05/2008 have been fully considered but they are not persuasive.

3. Re claim 1, the Applicant contends that Ye fails to teach or suggest scalability for motion information. However, the Examiner respectfully disagrees. Ye discloses that the base layer is the lowest resolution frequency band (Ye: paragraph [0068]) and that the remaining frequency bands are treated as enhancement layers (Ye: paragraph [0068]). Furthermore, the MCTFs (Ye: Fig. 2, elements 204a-204n) each correspond to a separate band, and each MCTF generates a motion vector for its respective frequency band (Ye: paragraph [0069]), wherein each motion vector is sent to the MV encoder (Ye: Fig. 2, element 210), which is separate for the coder that processes texture information. According to Ye, the enhancement layers are decoded only if possible (Ye: paragraph [0077]), indicating that a picture can be reconstructed when only some of the bands can be decoded. Since each frequency band, and its corresponding motion vector, represents a separate layer, Ye provides a means for scaling the motion vectors according to their respective frequency bands.

4. Re claims 7 and 16, the Applicant contends that Ye fails to teach or suggest that partitioned motion information and texture signals can be successfully decoded.

However, the Examiner respectfully disagrees. Ye discloses that the base layer is the lowest resolution frequency band (Ye: paragraph [0068]) and that the remaining frequency bands are treated as enhancement layers (Ye: paragraph [0068]). Ye further discloses that the MCTFs (Ye: Fig. 2, elements 204a-204n) each correspond to a separate band, and each MCTF generates a motion vector for its respective frequency band (Ye: paragraph [0069]), wherein each motion vector is sent to the MV encoder (Ye: Fig. 2, element 210), which is separate for the coder that processes texture information. According to Ye, the enhancement layers are decoded only if possible (Ye: paragraph [0077]), indicating that a picture can be reconstructed when only some of the bands can be decoded. Furthermore, Ye discloses partitioning data the data for transmission over a data network (Ye: paragraph [0026]).

5. Re claim 17, the Applicant contends that Ye fails to teach or suggest that the puller can partition the compressed motion information and the compressed video texture signal to form a compressed bitstream. However, the Examiner respectfully disagrees. Ye discloses a multiplexer that combines compressed video bands and compressed motion vectors into a bitstream (Ye: Fig. 2, element 212; paragraph [0070]).

6. A modified copy of the previous rejection, reflecting the changes made to the claims via the amendment filed 1/05/2008, is included below.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1, 7, and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ye et al. (US 20060146937 A1) in view of Turaga et al. (US 7023923 B2).

Re **claim 1**, Ye discloses a method for interframe wavelet video coding, comprising: an encoder for inputting video frames (Ye: Fig. 1, element 110; paragraph [0020]), comprising a Motion Compensated Temporal Filtering (MCTF) analyzer (Ye: Fig. 2, elements 204a-204n; paragraph [0030]), a spatial analyzer connected to said MCTF analyzer (Ye: Fig. 2, element 202; paragraph [0029], the transform spatially decomposes a video frame into bands), a wavelet coefficients encoder connected to said spatial analyzer (Ye: Fig. 2, element 202; paragraph [0029], each band is represented by wavelet coefficients), a packetizer connected to said wavelet coefficients encoder (Ye: Fig. 2, element 212, multiplexing for transmission over a network indicates packetizing data), a motion estimator embedded or connected to said MCTF analyzer (Ye: paragraph [0031], each MCTF has a motion estimation unit), and a Motion Information (MI) encoder connected to said motion estimator (Ye: Fig. 2, element 210; paragraph [0040]); a decoder for outputting video frames (Ye: Fig. 1, element 118; paragraph [0023]), comprising a de-packetizer (Ye: Fig. 4, element 402; paragraph

[0043], the demultiplexer separates bands and motion vectors, indicating depacketizing), a wavelet coefficients decoder connected to said de-packetizer (Ye: Fig. 4, element 410; paragraph [0046]), a spatial synthesizer connected to said wavelet coefficients decoder (Ye: paragraph [0046], bands are transformed back into the spatial domain), an MCTF synthesizer connected to said spatial synthesizer (Ye: Fig. 4, element 408a-408n; paragraph [0045]), and an MI decoder connected to said de-packetizer and said MCTF synthesizer (Ye: Fig. 4, element 406; paragraph [0044]); and a puller connected to said encoder and said decoder, wherein said method is to partition an MI for scalability and to transfer a partition of said MI to a terminal to achieve said scalability (Ye: paragraph [0029], separation of the signal into bands acts as a means for creating scalability).

Ye does not explicitly disclose that the wavelet coefficient encoder, the motion information encoder, the wavelet coefficient decoder, and the motion information decoder are entropy encoders or entropy decoders. However, Turaga discloses motion compensated temporal filtering based on multiple reference frames for wavelet based coding, wherein wavelet coefficients and motion are entropy encoded (Turaga: column 5, lines 21-26) and the wavelet coefficients and motion information are entropy decoded (Turaga: column 7, lines 6-13). Since both Ye and Turaga relate to motion compensated temporal filtering and wavelet transformation, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the entropy encoding and entropy decoding of Turaga with the coding scheme of Ye in order to

maximize coding efficiency by utilizing variable length codewords (Turaga: column 5, lines 28-30). The combined system of Ye and Turaga has all of the features of claim 1.

Re **claim 7**, Ye discloses that said MI encoder is to split all motion vectors of all said partitions into a base layer and one or more enhancement layers (Ye: paragraphs [0040]-[0041]; each band is equivalent to a layer) and to apply MI coding on said base layer and said enhancement layers to compress said MI applied with MI encoding so that wherein an output of a compressed MI is obtained by an input of said MI (Ye: paragraph [0070], motion vector encoder receives the motion vectors from the MCTFs and compresses the motion vectors, wherein said compressed motion vectors are sent to a multiplexer to create a bitstream); and said compressed MI can be partially decoded (Ye: paragraph [0077], enhancement layers are decoded only if possible, indicating that a picture can be reconstructed when only some of the bands can be decoded).

Ye does not explicitly disclose that the motion information encoding is entropy encoding. However, Turaga discloses motion compensated temporal filtering based on multiple reference frames for wavelet based coding, wherein wavelet coefficients and motion are entropy encoded (Turaga: column 5, lines 21-26) and the wavelet coefficients and motion information are entropy decoded (Turaga: column 7, lines 6-13). Since both Ye and Turaga relate to motion compensated temporal filtering and wavelet transformation, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the entropy encoding and entropy decoding of Turaga with

the coding scheme of Ye in order to maximize coding efficiency by utilizing variable length codewords (Turaga: column 5, lines 28-30).

Re **claim 16**, Ye discloses that said MI decoder is to apply MI decoding on received partial or complete compress MI and combine a base layer and decoded enhancement layers (Ye: paragraphs [0044]-[0047] and [0077]-[0079], base layer and enhancement layers) and said MI decoder to form a motion vector so that an output of an MI is obtained by an input of a compressed MI applied with MI encoding (Ye: paragraphs [0044]-[0047] and [0077]-[0079], base layer and enhancement layers).

Ye does not explicitly disclose that the motion information encoder and the motion information decoder are entropy encoders or entropy decoders. However, Turaga discloses motion compensated temporal filtering based on multiple reference frames for wavelet based coding, wherein wavelet coefficients and motion are entropy encoded (Turaga: column 5, lines 21-26) and the wavelet coefficients and motion information are entropy decoded (Turaga: column 7, lines 6-13). Since both Ye and Turaga relate to motion compensated temporal filtering and wavelet transformation, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the entropy encoding and entropy decoding of Turaga with the coding scheme of Ye in order to maximize coding efficiency by utilizing variable length codewords (Turaga: column 5, lines 28-30).

Re **claim 17**, Ye discloses that said puller is to read bit-rate/frame-rate/image-size information to partition a compressed video content bitstream (Ye: paragraph

[0032], band filtering depends on optimizing the efficiency/complexity constraints); to decide whether one or more enhancement layers are needed on said bit-rate/frame-rate/image-size (Ye: paragraph [0033], band filtering depends on optimizing the efficiency/complexity constraints); to send the MI of a base layer (Ye: Fig. 7; paragraphs [0068]-[0070], since the base layer is the layer with the minimum amount of information required for reconstructing a picture, its motion information is always sent); and to combine said partitioned compressed video content bitstream and a partitioned MI obtained by partitioning the MI of said enhancement layers according to said bit-rate/frame-rate/image-size, to form a compressed bitstream (Ye: paragraphs [0068]-[0070]; Fig. 2, element 212; paragraph [0070], multiplexer combines compressed video bands and compressed motion vectors into a bitstream).

Conclusion

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

a. 3-D morphological operations with adaptive structuring elements for clustering of significant coefficients within an overcomplete wavelet video coding framework

Turaga et al. (US 20070110162 A1)

b. Method for coding a video image taking into account the part relating to a component of a movement vector

Boisson et al. (US 20070189389 A1)

c. Scalable encoding and decoding of interlaced digital video data

Marquant et al. (US 20070147492 A1)

d. Fully scalable 3-d overcomplete wavelet video coding using adaptive motion compensated temporal filtering

Ye et al. (US 20060008000 A1)

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER FINDLEY whose telephone number is

(571)270-1199. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on (571) 272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Findley/

/Marsha D. Banks-Harold/

Supervisory Patent Examiner, Art Unit 2621